C_{x_i} as a function of the geometry of plate 7 in accordance with the numerator, when the denominator remains substantially constant.

Since plates 5 and 7 shown in FIG. 2 are complementary, then, the sum of the respective individual capacitance areas, which areas are shown for example by sections 55 and 57 which are a projection of capacitor plate 53 is constant. With the sum of these areas constant and C_{x_i} and $\overline{C}_{x_i}$ made large compared to C_g, it can be seen from the above equation, wherein only X-drive plate 7 is driven, that the signal produced on the array of grid lines 11—25 is a function of the ratio of the capacitance due to sections of plate 7 to the sum of the capacitances due to sections of both plates 5 and 7 and is independent of their absolute values. Thus,

$$Vo=\frac{C_{x_i}}{C_{x_i}+\overline{C}_{x_i}}$$

In this respect it can be seen from this equation that the thickness of the dielectric between plates 5 and 7, so long as uniform in the Y-direction over areas such as 55 and 57, does not affect the value of the output voltage.

If the ratio of the numerator to denominator in the above equation varies linearly, as is the case in the triangular arrangement of FIG. 2, then, the output voltage from grid line to grid line will vary linearly. However, it is evident that this ratio could be made to vary according to any desired function by varying the geometric configuration of plates 5 and 7. Thus, where instead of employing a voltage division arrangement to sense position, two equal frequency phase-shifted signals are employed to drive the transducer so that the degree of phase shift varies with position, nonlinearity in the phase relationship could be corrected by compensating nonlinearity introduced by the geometric configuration of drive plates 5 and 7. Thus, the divisional cut between plates 5 and 7 could be made selectively curved to give a selected nonlinear voltage response on grid lines 11—25 as a function of position along plates 5 and 7.

During time T_2 when both X-drive plates 5 and 7 are simultaneously driven, the output voltage is represented by

$$Vo=\frac{C_{x_i}+\overline{C}_{x_i}}{C_g+C_{x_i}+\overline{C}_{x_i}}$$

Since, as previously discussed, in the arrangement of FIG. 2 the area represented by 55 is always the complement of the area represented by 57, wherever taken, then, $\overline{C}_{x_i}$ is always the complement of C_{x_i}. Since the sum of C_{x_i} and $\overline{C}_{x_i}$ is a constant K, then,

$$Vo=K/(K+C_g)$$

It thus can be seen here that Vo is independent of the X position, where C_g is constant with X. If, however, C_{x_i} and $\overline{C}_{x_i}$ are made large compared to C_g, then,

$$Vo=1$$

and Vo is independent of any possible variations in C_g. Thus, it can be seen that so long as a comparatively large rectangular arrangement is used a reference voltage constant with positions can be obtained irrespective of how the plate may be divided to form the complementary pair.

Although discussion of the complementary pair of drive plates has been limited to X-drive plates 5 and 7, it is clear that this discussion applies equally well to all of the complementary drive plates shown in FIG. 2.

FIG. 4 shows a portion of the cross-sectional view of the X–Y position transducer arrangement of FIG. 2 in a possible assembled form. The view may be taken, for example, parallel to the Y-grid lines 31—45 shown in FIG. 2. As shown in FIG. 4 dielectric layer 1 may be a sheet of MYLAR of selected thickness and uniformity. On both the top and bottom surfaces of the dielectric layer 1 a conductive layer of, for example, copper may first be deposited. Then, the layers of copper may be etched to form the layers of X and Y grid lines, shown as 15—19 and 45, respectively in FIG. 4. On top of each of the layers of X and Y grid lines another layer of dielectric may be provided, as shown by 14 and 16 in FIG. 4. In addition, further dielectric may be provided between the various grid lines, as shown at 18.

Although the drive plates of FIG. 2 are not shown in FIG. 4 it is clear that they may be fabricated in the same manner as the grid lines. Thus, the X-drive plates may be etched on the bottom surface of dielectric layer 1 along with the Y-grid lines. Likewise, the Y-drive plates may be etched on the upper surface of dielectric layer 4 along with the X-grid lines.

As shown in FIG. 4, when stylus 4 is positioned on or above the layer of dielectric 14 a voltage indicative of the X-Y position of the stylus is capacitively coupled to the stylus. Stylus 4 may comprise a conventional ballpoint pen conductively coupled from its point to an output device. In such an arrangement a writing medium may be interposed between the pen and tablet surface for making hard copy while the movement of the pen is electronically being sensed for information recognition and entry into, for example, a computer.

What we claim is:

1. A capacitive voltage divider comprising:
- a plurality of individual capacitor plate means; and
- plate means coupled to an alternating voltage source and capacitively coupled to each of said plurality of individual capacitor plate means with the area of said plate means capacitively coupled to each of said individual capacitor plate means varying from individual capacitor plate means to individual capacitor plate means over said plurality of individual capacitor plate means so that the capacitance from individual capacitor plate means to individual capacitor plate means varies according to the said varying of said area; and
- means for coupling a further capacitance between each plate means and said alternating voltage source so that the potential at individual ones of said plurality of individual capacitor plate means varies in accordance with the manner in which said capacitance varies.

2. The capacitive voltage divider as set forth in claim 1 wherein said plate means comprises an integral conductive plate with the said area of said plate capacitively coupled to each of said capacitor plate means varying from individual plate to individual plate over said plurality of individual capacitor plate means as a function of the geometric configuration of said plate.

3. The capacitive voltage divider as set forth in claim 2 wherein said means for coupling a further capacitance comprises a plurality of capacitances corresponding in number to the said plurality of individual capacitor plate means wherein said plurality of capacitances are coupled to respective ones of said individual capacitor plate means and wherein a plurality of voltage tap means are respectively coupled to a point between each of said plurality of individual capacitor plate means and said like plurality of capacitances so that the voltage from tap to tap varies according to the said geometric configuration of said plate.

4. The voltage divider as set forth in claim 3 wherein said like plurality of capacitances vary from capacitance to capacitance inversely as the said capacitance from individual plate to individual plate varies.

5. The voltage divider as set forth in claim 4 wherein said like plurality of capacitances comprises a corresponding second plurality of individual capacitor plate means each capacitively coupled to an integral conductive plate which has a geometric configuration which is the complement of the said geometric configuration.

6. The voltage divider as set forth in claim 5 wherein said first recited plurality of individual capacitor plate means and said corresponding second plurality of individual capacitor plate means are respectively in integral form.

7. A voltage divider device comprising:
- a first plurality of capacitive plate areas conductively coupled together and varying in area from plate area to plate area;
- a second plurality of capacitive plates individual ones of which are capacitively coupled to respective individual